

Kerb Chemigation Practices

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The special local need (SLN) registration for applying Kerb trough sprinklers to lettuce has been in effect for the past two seasons in Arizona. In general, this technique has been very effective and few complaints or failures have been reported. Like all practices, however, proper procedures need to be followed to increase the likelihood of success. The most critical aspects of this technique are proper timing, duration of application and post application water volumes. Tests have been conducted to evaluate these practices and will be reviewed in this paper.

Timing

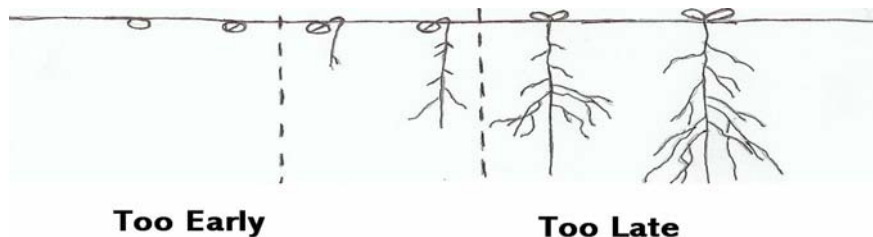
Proper timing is the most important aspect of this technique and when failures occur it is most commonly because of poor timing. Kerb can leach below germinating weed seeds when sprinklers are used. If too much water is applied between Kerb application and weed germination, poor weed control will result. Several tests conducted over the past 6 years have demonstrated that delaying the application can overcome this problem. The objective is to apply the Kerb just before or after the weed seeds germinate.

On most soils, delayed applications have to be made either by air or through the sprinklers. Tests have shown that chemigation through sprinklers is often more uniform and consistent than aerial applications. Regardless of the application technique, poor timing will result in poor weed control.

Proper timing will vary by season, environmental conditions, weed species, seed depth and other factors. Optimal time of application can change from field to field and year to year. General guidelines have been established based upon tests conducted over 5 years. These guidelines are:

Season	Date	Application timing (days after starting sprinklers)
Early	Sept. 1 to Oct. 15	1-3 days
Mid	Oct. 15 to Dec. 15	3-6 days
Late	Dec. 15 to Jan	5-6 days

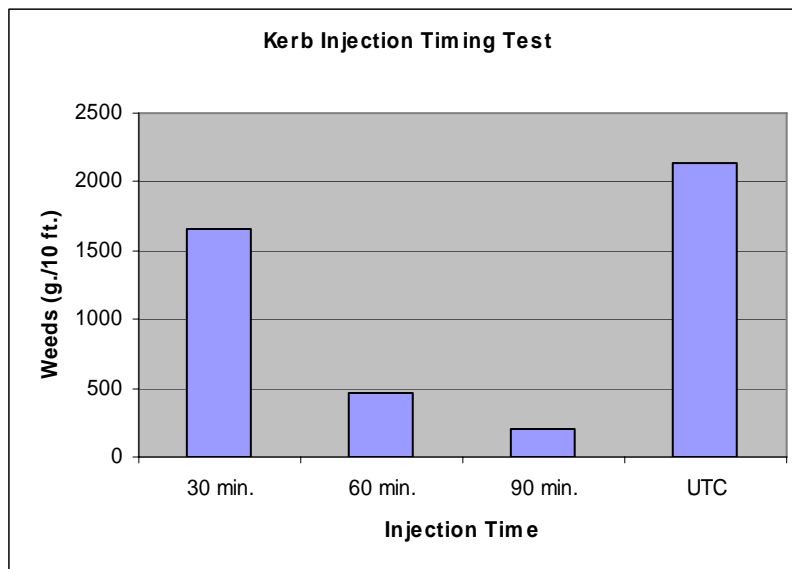
These are general guidelines and there has been a need for a more definitive technique to time Kerb applications. A technique has been developed by Mike Snyder at the Dune Co. of Yuma that uses the growth stage of the lettuce plant to time applications. This technique makes the assumption that the germination time of the lettuce roughly corresponds to that of the weeds. Applications are made when the lettuce seed has germinated and the radicle has bent downward. (see diagram) Some weed seed will germinate earlier and some later than the lettuce but this technique removes some of the guessing and helps avoid applications that are much too early. It is especially easy to make applications that are too early when the soil temperatures turn cold in Dec.-Jan. and weed seed is taking 6 to 14 days to germinate.



Duration of Application

Many different chemigation application units have been built by growers and applicators. There is a great variation in the types of tanks, pumps, valves, flow meters and other components. They are well designed and built to treat thousands of acres and most have the capacity to vary the time it takes to inject the Kerb. The conventional wisdom on establishing the duration of injection has been that it should take long enough to even out inconsistent sprinkler patterns but short enough to minimize exposure to environmental factors such as wind. Most applicators take approximately one hour to inject the Kerb regardless of field size. A one hour injection time has been generally successful. Occasionally when a failure has occurred, it has been speculated that the injection time was too short if it was much below one hour. A test was conducted this season to evaluate injection times.

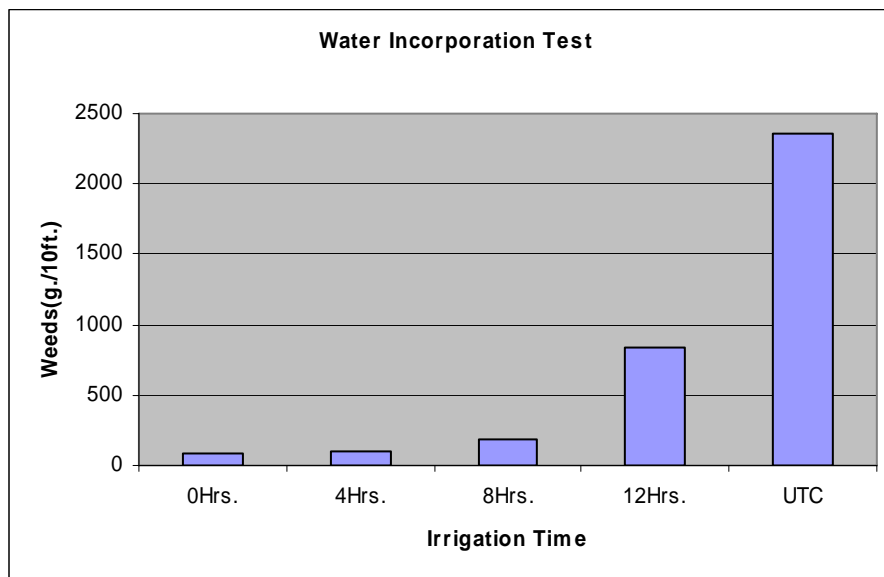
The test was conducted at the University of Arizona Yuma Valley Agriculture Center between Oct. 15 and Nov. 15. 1.3 lbs. per acres of Kerb was applied through sprinklers in 30, 60 or 90 minutes on the 4th day after the sprinklers had been started. The injection rate was set at 1 gallon per minute to achieve the variable injection times. The plots measured 12 beds by 150 ft. with 12 row buffers on each side. Each treatment was replicated three times. Mustard was planted over the lettuce as an indicator weed and was harvested on Nov. 24 to evaluate weed control. The fresh weights measured are presented in graph 1.



It is apparent from these results that injection duration has a significant effect on weed control with Kerb. The 30 minute injection time was little better than the untreated check. The 60 minute timing was far better and the 90 minute timing was the best. The reason for this is unclear although some have speculated that a thinner layer of Kerb is applied on the surface with shorter injection intervals. Regardless of the cause, it was clear from this trial that injections of 30 minutes were too short and affected the weed control from Kerb.

Post Application Water Volume

The Kerb SLN label specifies that 4 to 6 hours of water should be applied following the Kerb injection to incorporate the herbicide. This practice has worked well but has not been verified under local conditions. A test was conducted to determine how much post application water is too little for incorporation and how much is too much and will leach the herbicide below the germinating weed seeds. This test was similar to the injection timing test described above but contained the following treatments: 1.3 lbs. of Kerb applied through the sprinklers and followed by 1) no irrigation until the following day, 2) 4 hours of irrigation, 3) 8 hours of irrigation, and 4) 12 hours of irrigation. This test also contained an untreated check. The results are presented in Graph 2.



These results demonstrate that shutting the sprinklers off after the Kerb application until the following day, which in this test was 18 hours later, worked very well. Running the sprinklers for 4 hours after application also worked well. The Kerb began to leach and the weed control dropped after 8 hours of sprinkler irrigation. The worst treatment was where the sprinkler had run for 12 hours after application and leached the herbicide.

Acknowledgments

This study was supported by the Arizona Iceberg Lettuce Research Council